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THE OHIO STATE UNIVERSITY
COLLEGE OF EDUCATION
GEORGE F. ARPS, *Dean*

We are happy to announce that Miss Helen Parkhurst, author of *Education on the Dalton Plan*, will offer courses in the Department of School Administration, College of Education, Ohio State University, the first term of the Summer Session, 1927.

Miss Parkhurst's work in experimental education is internationally recognized. The Dalton Laboratory Plan is attracting increased interest both in Europe and in America. The courses offered by Miss Parkhurst should prove attractive both to administrators and to teachers interested in new ideas in administration and supervision.

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Educational Research Bulletin

FUNDAMENTAL SKILLS IN NINTH-GRADE ALGEBRA

B. R. Buckingham
Ohio State University

I well remember the first words of the algebra textbook I used as a boy. "Algebra," sententiously remarked the author, "is universal arithmetic." For many years I wondered what that meant. I now know that it was the best of definitions and also the worst—best because it puts a great truth briefly, worst because no student who begins the study of algebra can possibly comprehend it.

We no longer think of definitions as of fundamental, initial value in the study of a subject. The time was when if you could not tell what geography was you were held to be ignorant of the whole field of geography. If you couldn't define a conjunctive adverb, presumably you couldn't use one. It was the delight of school visitors not so long ago to open a conversation with a boy after this manner: "Jim, are you studying arithmetic?" Now Jim knew perfectly well what was coming. Being caught, so to speak, with the evidence all about him, he could scarcely deny the implied accusation. Shivering with apprehension therefore Jim managed a hopeless, "Yes, sir." This was the visitor's cue, also his triumph. Maliciously he shot at Jim the inevitable question, "What is arithmetic?" If Jim were lucky he glibly rejoined, "The science of numbers and the art of computing by them." But Jim might be the best boy in the class in arithmetic without being able to utter these cabalistic words.

I think some of the philosophers of education are tarred with the same stick as the old-fashioned school visitor. They seem to think that you must know the ultimate aim of education and the precise manner in which a given subject such as algebra fits into that aim. They ignore the fact that no two of them can agree on what the aim of education is, but with the same triumphant air that the old-fashioned school visitor used to assume, they ask, "How can you teach school unless you know what education is for?" "How can you learn algebra unless you know what algebra is?" For the most part this is pure "bunk." Those of us who are willing to hitch our wagon to something less lofty than a star are satisfied that we get more locomotion with less danger by sticking closer to the ground.

We look upon algebra, and some other school subjects too, as calling for the acquiring of certain fundamental skills. I would far rather that a teacher of mine had clear notions of what these fundamental skills were than that she should be expert in discussing without settling the question of the ultimate value of algebra. I don't mean by that, that the discussion of the ultimate value of the curriculum and of items in the curriculum is unimportant. I do hold, however, that it is insufficient and that the place for such discussion, and the expert thinking engendered by it, is

among those who make the curriculum and administer it in a large way.

What then are these fundamental skills in elementary algebra? We may speak of skill in algebra but by this we mean a degree of facility in a variety of ways. Thus skill in algebra may be analyzed into skill in the fundamental operations, skill in solving linear equations, skill in factoring, skill in graphs, skill in solving simultaneous linear equations, skill in solving quadratic equations. Each of these skills, however, is still further resolvable. The fundamental operations naturally break up into addition, subtraction, multiplication, and division; and each of these must be analyzed into still smaller parts if effective teaching is to be done.

That is the trouble. Too much of our teaching is characterized by an unintelligent analysis of the job we have to perform. It is becoming a truism that teaching parallels learning—that you cannot teach algebra unless someone is learning algebra. The conditions of learning are most favorable when the learning task is analyzed into its elements or difficulties, each of these difficulties being presented one at a time until the whole topic under treatment has been covered.

The usual textbook in algebra devotes far too few pages to the introductory treatment of the subject. There are certain important ideas which must be conveyed in a detailed manner, such as the elementary symbolism of algebra—the meaning of ab, of a^2, of $a + b$, of the fraction $\frac{a}{b}$. These meanings cannot be conveyed merely by stating them. The pupil must practice them.

Consider, for example, the multiplication idea which is expressed in the symbol ab. In order that the child may apprehend this and know when to use it he should be given an opportunity to react correctly under a variety of situations calling for multiplication. What is the product of a and b? What is a multiplied by b? What is a times b? If the length of a rectangle is a feet and the width is b feet, what is its area? These do not begin to exhaust the list. In each of these questions I have used the term "what is?" All of them may be varied by putting them in the imperative mood and using such verbs as "tell," "state," "express," "write," "give," and "find." Moreover, in these multiplication cues I have used no other letters than a and b. I have not even inverted the a and the b. I have not used unusual cues for multiplying, such as the thoroughly vicious "a into b." I have not used negative numbers nor numbers with exponents. I have not used more than two numbers nor have I introduced the numerical coefficient. But perhaps I have said enough to indicate what I mean when I say that a skill, so obvious to those who teach algebra, may be far from easy for the child who is beginning the subject.

In what I have just said I have considered only one way of expressing the product of literal factors, namely, the writing of the letters together without an intervening symbol. The introductory treatment of the multiplication of monomials must deal with at least two other ways of expressing the same operation. If we are to indicate the product of a and b we must consider not only the form ab but also the form which uses the times sign between the letters and the form which uses the point between the letters.

At this juncture, I should like to pay my respects to the manner in which we have rendered algebra—and arithmetic, too, for that matter—gratuitously difficult by using a senseless variety of expressions for the same thing. Not a little of simplicity and directness could be achieved if we adopted only one way of expressing a given relation. The same is true in regard to methods of performing operations. In the elementary school we no longer commend a

teacher for her thoroughness because she teaches both the borrowing and the equal-additions methods of subtracting. We know that she unnecessarily confuses the child. Why should we in algebra teach three or four ways of solving simultaneous linear equations and an equally varied number of ways of solving an affected quadratic?

Let us consider for a few moments the four fundamental operations. The usual textbook treatment of addition first introduces monomials with perhaps fifteen or twenty exercises in the addition of similar expressions. It then brings forward polynomials and gives them a much more extended treatment. I should reverse this process. If a child knows how to handle monomials, the handling of polynomials in algebra is easy. The addition of polynomials is merely a succession of additions of similar monomials. The subtraction of polynomials is merely a succession of subtractions of monomials. In multiplication the same thing is true; one never at any point multiplies anything but monomials. Finally, in division the same statement may be made. There is nothing new in the treatment of polynomials except the polynomial itself and the fact that the examples are longer. One can do the work if one knows how to add, subtract, multiply, and divide with one-term expressions.

There is even some evidence to the effect that an operation with monomials may be harder than an operation with polynomials. For example, in a test given in Cleveland it was found that practically the same number of pupils made a mistake in combining the terms of the expression $x - 2x$ as failed to get the correct answer to the following addition example: $\frac{7x^2-x+3}{8x^2+2x-9}$. In the same test it was found to be considerably harder to subtract in the example $\frac{-6}{+8}$ than to subtract in the following example: $\frac{7a^2+8a-3}{7a^2+10a+4}$. Again only 75 percent of the children obtained the right answer in multiplying a^6 by a while 80 percent were correct in multiplying $x + 6$ by $x + 8$. There seems to be a persistent belief that because a thing is small it is easy. Under this impression the writers of the readers of an earlier day used invariably to employ the unusual word *gig* instead of the common word *wagon*. The *ox* came in for lengthy treatment, not so much because the ox was interesting or particularly important, but rather because the word *ox* was short. Among tools and implements the *ax* and the *adz* were special favorites for the same reason.

The handling of monomials in algebra is as fundamental as the handling of basic combinations in arithmetic. In algebra it is as essential that a child should know the various types of monomial division as it is that in arithmetic he should know the ninety fundamental facts in division. These types of monomial division are more numerous than one would at first suppose. Let us consider monomial dividends and divisors of the simplest kind, that is, expressions consisting of Arabic numerals. I have drawn up in Table I the 38 cases which may arise in this kind of dividing. The characteristics which distinguish these thirty-eight types are, first, the size of the dividend in relation to the divisor; second, the signs of the dividend and the divisor; third, the presence or absence of the plus sign before positive numbers; and fourth, the presence of a zero dividend.

Suppose now we annex a single letter without an exponent to each of the dividends in the table. We immediately create thirty-five new types of monomial division. The only types in the table which will not then be represented are the three in the last column in which the dividend is zero. If we annex a letter to the divisor we have thirty-eight more

types of monomial division. Some of these divisions, it is true, can only be indicated, but it is something for the child to know under what circumstances division must be indicated and under what other circumstances the operation should be performed. Again, if we annex a single letter to both the dividend and the divisor in this table we shall make seventy new types, thirty-five if the letters in the dividend and divisor unexpressed coefficient—that is, the coefficient "1" —in either the dividend or the divisor. Yet every teacher of algebra recognizes that there are real difficulties in handling terms in which the coefficient is unity. Again, I have said nothing about the presence of more than one letter in either the dividend or the divisor and nothing about the big question of exponents. You can see, therefore, that there are a vast number

TABLE I

THIRTY-EIGHT TYPES OF MONOMIAL DIVISION: ARABIC NUMERALS

	WITHOUT REMAINDER			WITH REMAINDER		D = 0
	D > d	D < d	D = d	D > d	D < d	
+ expressed						
$\frac{+D}{+d}$	$\frac{+10}{+2}$	$\frac{+2}{+10}$	$\frac{+2}{+2}$	$\frac{+7}{+2}$	$\frac{+2}{+7}$	$\frac{0}{+2}$
$\frac{+D}{-d}$	$\frac{+10}{-2}$	$\frac{+2}{-10}$	$\frac{+2}{-2}$	$\frac{+7}{-2}$	$\frac{+2}{-7}$	$\frac{0}{-2}$
$\frac{-D}{+d}$	$\frac{-10}{+2}$	$\frac{-2}{+10}$	$\frac{-2}{+2}$	$\frac{-7}{+2}$	$\frac{-2}{+7}$	
+ omitted						
$\frac{D}{d}$	$\frac{10}{2}$	$\frac{2}{10}$	$\frac{2}{2}$	$\frac{7}{2}$	$\frac{2}{7}$	$\frac{0}{2}$
$\frac{D}{-d}$	$\frac{10}{-2}$	$\frac{2}{-10}$	$\frac{2}{-2}$	$\frac{7}{-2}$	$\frac{2}{-7}$	
$\frac{-D}{d}$	$\frac{-10}{2}$	$\frac{-2}{10}$	$\frac{-2}{2}$	$\frac{-7}{2}$	$\frac{-2}{7}$	
$\frac{-D}{-d}$	$\frac{-10}{-2}$	$\frac{-2}{-10}$	$\frac{-2}{-2}$	$\frac{-7}{-2}$	$\frac{-2}{-7}$	

D means dividend; d means divisor.

are the same and thirty-five more if the letters are not the same. You may think that I am manufacturing types. You may think it unnecessary to recognize such types as $\frac{7}{-2a}$ or $\frac{10a}{2b}$ or $\frac{-2a}{7}$. I believe, however, that it is precisely the inability of the children to deal with such types of division which keeps them from making satisfactory progress.

In all the types I have distinguished both in the table and otherwise I have said nothing about the presence of the of theoretically distinct types of monomial division. We cannot brush any of them aside by saying that they are unimportant. They all occur as the child proceeds in the study of the subject. Only experimentation can determine how difficult each of these types is, the extent to which the learning of one type facilitates the learning of another type, and the extent to which all the types may be covered by two or three principles, such as "divide the numerical coefficient of the dividend by the numeri-

cal coefficient of the divisor," "like signs give plus and unlike signs give minus," and "subtract the exponent of a letter in the divisor from the exponent of the same letter in the dividend."

I know of no more fruitful work for an organization of mathematics teachers than the analysis of addition, subtraction, multiplication, and division of monomial quantities, first, into logical or theoretical types such as I have suggested and, second, into the types which really matter—that is, those which present distinguishable difficulties requiring separate treatment and practice. When this is done we may organize our approach to elementary algebra with scientific precision and with far greater prospect of successful treatment in the classroom.

AN INVESTIGATION INTO THE ELEMENTS OF ABILITY TO SPELL

LUELLA C. PRESSEY
Ohio State University

A SUMMARY of an investigation into the characteristics which differentiated good and poor readers when intelligence was held constant was given by the writer in *School and Society* for November 6, 1926.[1] In this investigation were involved fifty pairs of children of equal intelligence; but one child in each pair had a degree of comprehension in reading at least two grades above that of the other child. In this way, the really essential differences between the good and poor reader appeared. It was found that when intelligence was eliminated there were very important, although relatively few, differences due to reading difficulties themselves.

This year, the writer attempted a similar study of spelling. As a preliminary step, a group test of intelligence and a spelling test composed of fifty words on the same column of the Ayres Scale were given. The children testing in the same half-grade in intelligence were then grouped together and from this group pairs of children were selected so that within each pair the children were tested in the same half-grade in intelligence and two entire grades apart in their ability to spell. These children were, for the most part, in the fifth and sixth grades. In all, sixty-four such pairs, or 128 children, were selected.

The next step was to give some individual tests to the children. These tests were designed with the hope that they would measure the elements of spelling ability as differentiated from general ability. The tests used were the following: imitating sounds, imitating vowel sounds, hearing double consonants, remembering a series of sounds, recognizing syllables, marking the quality of vowels, writing consonant sounds and combinations, and remembering by sight.

Most of the above tests indicate their general character. For the first one, the sounds imitated were nonsense syllables. For the second, the long vowels, the short vowels, and the vowels before *r* were given for the child to imitate. For the double consonant test, two words were pronounced—one having a consonant doubled, the other having the same consonant single—and the child was to tell which word had the double consonant. The test for remembering

[1] "Specific Elements Making for Proficiency in Silent Reading, when General Intelligence Is Constant," pp. 589–92.

sounds consisted of requiring the child to reproduce a series of syllables which did not make any real word but which might conceivably make a word. The next test consisted of presenting the child with long, unfamiliar words and having him mark the divisions between syllables to see if he was aware that words could be broken up into smaller parts. The child also marked the vowels as long or short for these same words. The writing of consonant sounds consisted simply of sounding the consonant and such combinations as *th*, *sh*, *ch*, and *tion*. Remembering by sight was tested by presenting the child with words that were not particularly long but were both unfamiliar and unphonetic, such as "phlegm." The object of the test was to see if the child could remember a series of letters when they did not form a familiar word or a combination that was easily pronounced.

The value of these eight tests in differentiating the poor speller from the good speller of equal intelligence was as follows: hearing double consonants, writing consonant sounds and combinations, remembering by sight, imitating vowel sounds, remembering sounds, imitating sounds, marking vowels, recognizing syllables. It would appear that the work with recognizing syllables and marking vowels was not as discriminative as might be expected. The reason for this is probably that the results are considerably influenced by school training, so that the poor speller may have had more practice in breaking up words into syllables than the good speller who did not need such practice. It is thought that if the tests were given in the lower grades, before marking syllables and vowels had become a part of the school work, these two tests would have served about as well as the others. The remaining tests asked the child to do things with sounds and symbols that he had never had to do before, and consequently more nearly approached the elements which go into proficiency or deficiency in spelling.

The general conclusion from this experiment appears to be that spelling is largely dependent upon ear training. It is true that many of the fundamental words of a language are unphonetic, but it is also true that a large number of words are sufficiently phonetic for the sounds to give the spelling. Even in the case of words having silent letters the sounds will give all but one letter, and, if the child can add visual stimulus to the sound, the silent letter can be learned in its proper place. In most schools relatively little in the way of ear training is given. Having a good ear, however, and a good memory for sounds is an important factor in the case of children who, with the same amount of intelligence and approximately the same amount of school training, succeed in being good spellers rather than poor spellers.

The results of this analysis are now being tried out in a carefully controlled experiment in one of the Columbus schools. The teacher is trying to get the children to hear a double consonant when there is one, to hear the various vowel sounds and imitate them correctly, to hear the various consonant sounds and their combinations, and to look long and hard at a word which is not easily pronounced. The usual work of division into syllables and study of the vowels is also being carried on. The experiment is still too young for any data of considerable merit to have appeared, but it is the impression of the teacher that the children are learning to spell with an unusual degree of rapidity and that by ear training they are acquiring a good basis for further work in oral English and in foreign language.

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The Summer Quarter at Ohio State University will begin June 20, 1927. The last day of registration without extra fee will be June 18.

A COMPARISON OF DEPARTMENTAL AND GRADE TEACHING: A STUDY OF PROGRESS IN SUBJECT-MATTER

A. W. STEWART
Hilliards, Ohio

FOR the purposes of this study, grade teaching is defined as that type of school organization under which each teacher is assigned to the instruction of one group of pupils in all the school subjects. Departmental teaching is that type of organization under which each teacher instructs several groups of pupils in one subject or a group of related subjects. Grade teaching is commonly found in Grades I through VI, and departmental teaching is universally used in the high school.

Beginning in the last decade of the nineteenth century and continuing until the present, there has been a tendency to extend departmental teaching down into the grades. As early as 1905 there were 146 schools in the city of New York which had departmentalized seventh and eighth grades.[1] The literature of this period contained many reports of the introduction of the new method into Grades VII and VIII and in some cases, into the lower grades. Such reports usually included arguments for and against the departmental system.

In the early part of this period there was much discussion of departmental teaching in the current literature. However, as the movement to reorganize the upper grades of the elementary school grew into the junior high-school movement, departmental teaching as a topic of discussion had to share with the other reforms of the junior high school. Nevertheless, the junior high school practically always included departmental teaching and even the latest books on the junior high school include a discussion of departmental teaching. Furthermore, recent adoption of the platoon school by several cities has created a new interest in departmentalization.

One investigation which concerned the junior high school is worthy of mention here because it deals indirectly with departmental teaching. The study referred to is that made by Superintendent Paul C. Stetson in the high schools of Grand Rapids, Michigan.[2] In it he compared the high-school records of a group of pupils who had had their previous training in junior high schools with the records of a similar group trained in non-junior high schools. The study showed no advantage for the high-school pupils who had been trained in junior high schools.

During the summer of 1922, Dr. B. R. Buckingham, director of the Bureau of Educational Research, of Ohio State University, appealed to the superintendents in Ohio for a school in which this problem might be worked out. In response to this request, Superintendent R. G. Jones, of Cleveland, placed at the disposal of the Bureau the Murray Hill School of which Miss Julia A. Mulrooney was principal. The offer was accepted and the experiment was started in February, 1923, at the beginning of the second semester.

To carry out the experiment, the following items of procedure were necessary: (1) to divide the school from the

[1] Maxwell, William H. *Departmental Teaching.* New York, City Superintendent of Schools, 1905. pp. 195–203.

[2] Stetson, Paul C. "A Statistical Study of Scholastic Records of 404 Junior and Non-Junior High-School Students," *School Review*, 25:617–36, November, 1917.

fifth to the eighth grade into an experimental and a control group, equal in number and in ability to learn; (2) to organize the experimental group on the departmental plan and the control group on the grade plan; (3) to devise a plan by which the two groups would be given equal teaching ability; (4) to obtain an objective measure of the initial standing of each pupil in each subject for which gains were to be considered; (5) to secure an objective measure of the final standing at the close of the experiment of each pupil in each subject for which gains were to be considered; and (6) to compute the gains for each pupil, each grade, and each group in the various subjects considered.

It was obvious that the result of the experiment would be reliable only in so far as the factors affecting learning in the two groups could be stabilized. It was therefore essential that the two groups, experimental and control, be so chosen that, given equal opportunity, they would make equal gains. This was accomplished by giving all the pupils intelligence tests and pairing each pupil of the experimental group with one in the control group of equal ability as shown by the tests. To determine the intelligence score, two group intelligence tests were given.

Another important factor to be stabilized was the ability of the teachers. To control this factor, the teachers were divided into two groups, X and Y. During the first semester of the experiment, the X teachers were assigned to the experimental group and the Y teachers were assigned to the control group. At the beginning of the second semester, the teachers of the two groups were exchanged, the X teachers going to the control group and the Y teachers going to the experimental group. By this arrangement, each group had both sets of teachers during the year and the instruction for the two groups was identical in teaching ability.

Initial tests were given in reading, arithmetic fundamentals and problems, geography, spelling, and English. Different forms of the tests were repeated at the end of the first semester and again at the end of the second semester. The first tests were given by Robert K. Spears who was at that time an assistant in the Bureau of Educational Research of the Cleveland schools. At the end of the second semester they were administered by the writer. In no case were they given by teachers. All the achievement tests were scored by the writer and two assistants. The tests used were the Cleveland Survey in arithmetic, the Buckingham Scale for Problems, the Thorndike-McCall Reading Scale, the Buckingham-Stevenson Place-Geography Tests, the Charters English and Grammar Test, and word lists chosen from the Buckingham Extension of the Ayers Spelling Scale.

It will be observed that achievement tests were given at the close of the first semester. The results of these tests were not required for the computation of the gains made during the year, but they were used further along in the study.

Before gains could be computed it was necessary to express all test scores in a constant unit, that is, a unit that would be the same for different grades and for different subjects. A common way of doing this is to express each score in terms of its deviation from the mean of its distribution, the standard deviation being used as the unit. The T-score first used by Dr. W. A. McCall is an adaptation of this method, the chief difference being that the unit is one-tenth of the standard deviation and that negative scores are avoided by assuming a zero point at a -5 SD.[1] In the transmutation of test scores, distributions for each test were made and

[1]McCall, William A. *How to Measure in Education*. New York, Macmillan Company, 1922. pp. 272-306.

from these distributions, T-score tables, such as described by Dr. McCall, were derived. In making these tables, use was made of Dr. McCall's table showing the T-score corresponding to each percentile.[1] After all test scores were changed to T-scores, individual gains were computed by subtracting the initial from the final T-scores.

At this point a new pairing of pupils was necessitated due to the fact that some members of the group had failed to take all the examinations while others had withdrawn from the school or had been transferred. The first analysis of results consisted in finding the percent of the cases in which the gain made by the departmental pupil exceeded that made by the grade pupil with whom he was paired. In all, there were 887 pairs of scores to be so compared. In 42 percent of the pairs, the gain made by the pupil taught departmentally was greater. In 58 percent of the cases the pupil taught by the grade method exceeded the other member of the pair, who had received departmental instruction.

In the second analysis of results the gains were averaged by subject and by grades and finally by entire groups. The difference was then found between these average gains. This difference was called the "advantage" for the grade or departmental group. This comparison showed that the grade group had the advantage in each grade, this advantage ranging from 16 percent to 72 percent of the gains made by the departmental group in each case. In the problem test and the Cleveland Survey in arithmetic, in geography, and in grammar, the grade group made considerably greater gains than the departmental group. In reading, the grade advantage was not considerable. Only in spelling and language did the departmental group make the greater gains, and in the latter of these two the advantage was not quite a one-percent advantage. In the totals, the departmental group made a gain of 4.65 T-score points as against 6.66 for the grade group. The resulting advantage for the grade group is 2.01. Since this is 43 percent of the departmental gain, we may say that the pupils taught by the grade method made 43 percent greater gains than those taught by the departmental method.

As a measure of unreliability the probable error of the difference was used. For the total advantages, 2.01, this measure was .26. Since the advantage is more than seven times its probable error, we may conclude that the advantage is highly reliable. Further interpretation of this advantage in terms of probable error indicates that the chances are 285 to 1 that the true advantage is not less than .97 T-score which would be 21 percent of the total gain made by the departmental group. In other words, the chances are 285 to 1 that the pupils taught in the grade organization made not less than a 21 percent greater gain than those taught departmentally.

Before the close of the period during which the experiment was to run, as originally planned, it was decided to continue it through a third semester. The object of this further study was to get data that might serve in the interpretation of the results of the first two semesters. It was planned to use departmental teaching in both the groups to see what relative gains they would make when taught under conditions as similar as it was possible to make them. The ratio found to exist between the average gains during the additional semester would then be used as a basis for interpreting the gains resulting from the first two semesters.

Permission was granted to continue the experiment after it was agreed that the pupils of Grade VIII should not be included, since they were then ready to enter high school. Pupils were again

(Continued on page 220)

[1] Op. cit. pp. 274-75.

Ohio State University

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B. R. BUCKINGHAM - - - - *Editor*
JOSEPHINE MACLATCHY - *Assistant Editor*

Address all communications to the
BUREAU OF EDUCATIONAL RESEARCH
Ohio State University, Columbus, Ohio

RESEARCH AND PHILOSOPHY

THE kind of education offered to young people by the adults of a given historical period or of a given type of civilization is commonly said to conform to the prevailing sense of human values. China, Sparta, Athens, and Rome do duty as examples. Now, what is commonly said and believed, no doubt has much truth in it. This dictum of the educational historian is true enough as a broad generalization. Yet we are sure that in our day—the day in which most of us do our living—the truth of this notion is not so accurate that it does not permit of many maladjustments. Its probable error, so to speak, is high.

Undoubtedly, no period in the past has been so complex as ours. We cannot agree on a definition of the present issues of life, nor do we believe that the future historian will be able to express in portable form the spirit of the age which is now passing. Manifestly, the purposes of life are not one but many; and the aim of education is not therefore either this or that, but many things at different times for different people. Yet in spite of this complexity, and in spite of the fact that the agreement between life purposes and education is but broadly general, we are attempting to adjust means to ends more consciously than the people of any other period. Moreover, it is certain that at no former time have the methods of adjustment been more abundant or better understood. It is possible, therefore, that the supposed consonance of social needs with the training of the young may become, in the not-far-distant future, more real than ever before. In spite of the diversity of our aims we may become even more certain that our measures produce their intended effects than could the primitive savage practicing his initiatory rites. Due to our instruments of measurement we may become more successful in our practice than Greek or Roman, Scholastic or reformer; and to a greater extent than any of these we may secure as between our ideals and our methods a demonstrated accord.

Meanwhile, it is the task of research to disclose the worthy aims of education, to devise means for attaining them, and to record the success which attends the use of the methods and materials thus selected as appropriate for the purposes of society. Therefore, research from one point of view includes philosophical inquiry; and from another point of view it tests, selects, and renders effective the solutions which philosophy offers. To divorce philosophy and research is impossible—as impossible as it is to divorce experimental from introspective psychology. And for the same reason. Without the descriptive and speculative processes the experimental or scientific activities lack interpretation. Without the scientific methods, philosophical inquiry lacks concreteness. Without science, philosophy is uncertain, conflicting, and unconvincing. Without philosophy, science is blind, unmeaning, and petty. We can imagine no more helpful educational organization than that which should exalt both philosophy and research. For example, a school of education in a great university should, in our judgment, elevate its research

activities through the directive and refining influence of the best philosophical thought. This does not appear to be thought of. The craze today is for measurement—for counting and comparing in quantitative terms. It would be as silly as it would be untrue for us to deprecate this type of thinking. But there come times when the merely quantitative seems incomplete and unsatisfactory. We observe, moreover, that those research workers are most influential who appeal most frequently to higher sanctions than central tendencies or curves of error.

AN IMPORTANT TEXTBOOK

A BOOK of vital interest to all educators in the elementary field whether they be parents, teachers, or administrators, is the introductory volume of the Buckingham-Osburn arithmetic series.[1]

The marked unity in agreement between the purpose stated in the Preface of the book and the contents is due largely to the fact that the authors wrote their own Preface. The purpose of the book is to improve the teaching of primary arithmetic as to subject-matter and method. The content of the book has been selected on the basis of scientific evidence collected from research studies in teaching primary arithmetic. The material in the book has been subjected to the test of classroom use. As one reads the book, he is conscious of the writers' knowledge and application of the psychology of the learning process. It contains excellent teaching devices, cautions, suggestions, and methods to be used in teaching.

Dr. Buckingham and Dr. Osburn advocate the teaching of no combination before the pupil has been taught to read and write the numbers of the combinations and the meaning of the numbers involved in the combinations. The plan of the book attempts to prevent counting on the part of the children, to reduce interference in learning, and to take into account the difficulty of the material to be learned by the child. If the cautions given on "varying the responses" and "the accuracy deal" were put into skillful practice by the teachers, much of the drudgery in teaching would disappear. The first chapter gives an interesting discussion on number work for the first grade; also a summary of number abilities to be acquired by pupils in the first grade.

The several chapters on drills and games bring together various suggestions and teaching devices. The organization and selection of material in these chapters tend to utilize the play element in the learning process, while units of measure, ordinals, Roman numerals, signs, and vocabulary furnish the content for other interesting chapters.

The verbal and illustrative problems suggested throughout the book furnish situations involving relationships that require a solution through the application of combinations that have been learned. The facts in these problems have a basis in the child's experience and will stimulate his thinking. Introducing verbal problems as soon as combinations are learned and encouraging children to make original problems are certainly worth-while suggestions.

The major part of the book is devoted to a discussion of the arrangement and the method of teaching the basic combinations in addition and subtraction. The combinations in both fundamental processes have been divided into an easy group and a hard group. The easy combinations are those whose sums and minuends are less than ten, while the hard combinations are those whose sums and minuends exceed nine. The tables on pages 20, 21, 25, 271, and 272 are interesting and give all the combinations. Dr. Buckingham's findings in research studies have guided the authors

[1] Buckingham, B. R., and Osburn, W. J. *The Buckingham-Osburn Searchlight Arithmetics.* Introductory Book. Boston, Ginn and Company, 1927. xv+382 pp.

in advocating, first, the take-away process in teaching addition, second, the teaching of addition facts along with their related subtraction facts, and, third, the downward process in teaching column addition.

The authors urge that a definite stand be taken by school systems as to the methods to be used in teaching the three points mentioned above. He makes a plea for consistency in teaching these points regardless of what method is used. No doubt many who read this book will not indorse the three suggestions given. Reading of the book, however, may challenge and tend to clarify their thinking on many points.

As a whole, the book is an excellent piece of work, and is without question a timely and outstanding treatment of the teaching of addition and subtraction in the second and third grades. It will serve not only as a text for special-method classes in normal schools and colleges, but also as a source of guidance for classroom teachers who wish to improve their technique in teaching primary arithmetic. The book also has much in it for the curriculum makers who are in sympathy with the modern scientific point of view in education.

MILDRED M. MILLER
Primary Supervisor, Cleveland Heights

WHAT OBJECTIVES, IF ANY, SHALL WE STRESS?

JAMES L. LA POE
Ohio State University

IN 1918 the United States Bureau of Education issued a bulletin entitled *Cardinal Principles of Secondary Education*, the subtitle of which is "A Report of the Commission on the Reorganization of Secondary Education, Appointed by the National Education Association." In this bulletin we read:

> This commission, therefore, regards the following as the main objectives of education: 1. Health. 2. Command of the fundamental processes. 3. Worthy home-membership. 4. Vocation. 5. Citizenship. 6. Worthy use of leisure. 7. Ethical character.
>
> The naming of these objectives does not imply that the process of education can be divided into separate fields. This cannot be, since the pupil is indivisible. Nor is the analysis all-inclusive. Nevertheless, we believe that distinguishing and naming these objectives will aid in directing efforts; and we hold that they should constitute the principal aims in education.

The creation of this committee and the work that it accomplished may be said to mark a turning-point in education in this country. It clarified and crystallized the more or less haphazard thinking on secondary education, and its influence has been great. Since that time, we have seen some significant steps towards its reorganization, and signs are in evidence that the change, particularly with reference to the curriculum, will be continuous.

President C. L. Phelps, of State Teachers College, Santa Barbara, California, pointed out that these seven objectives are not all of equal importance, and he proposed that they be weighted on a numerical basis, so that there might be some index as to the relative amount of emphasis which should be given to each in elementary schools.[1] Accordingly, he asked a number of city superintendents and teachers' college presidents, from different parts of the United States, to weight the first six objectives on a scale of 100 points.[2] Sixty-two superin-

[1] *Second Yearbook*: "The Elementary School Curriculum." Washington, D. C., Department of Superintendence, 1924. p. 85.

[2] President Phelps "feels that 'ethical character' is an inclusive objective and cannot be weighted in terms of the others." *Ibid.* p. 85.

tendents and teachers' college presidents responded to his request. When their replies were tabulated, he found their average judgments to be as follows:

Health	18.4
Command of fundamental processes	30.8
Worthy home-membership	12.3
Vocation	10.4
Citizenship	17.6
Worthy use of leisure	10.4

Since the seven objectives were proposed by a committee whose work was directly concerned with *secondary* education, the writer desired to know how a representative sampling of high-school principals would weight them. Accordingly, as one part of a study dealing with the work of senior high-school principals, he asked a number of such principals in various sections of the country to weight the objectives. Three hundred and eighty-one principals took part in the study, and of this number, 254 attempted to respond to this particular part of the questionnaire.[1] Of the 254, 224 weighted the objectives as requested, and thirty others simply ranked them, 1, 2, 3, 4, 5, 6, 7, without attempting to weight them. In addition, the principal of the high school at Ogden, Utah, had the thirty-seven teachers in that school weight them, and he submitted a table showing the individual and composite weighting by this group. The accompanying table shows the rankings of these seven objectives as they were evaluated by four groups of people, all of whom are engaged in educational work. The findings of President Phelps are included in the table for the sake of easy comparison. The table should be read as follows: "Out of 100 possible points, 224 principals assigned 17.7 points to health; thirty-seven high-school teachers and sixty-two city superintendents and

TABLE I

RANKING OF SEVEN OBJECTIVES OF EDUCATION BY FOUR GROUPS OF EDUCATORS*

SEVEN MAIN OBJECTIVES OF EDUCATION	WEIGHTED RANKING BY 224 SENIOR HIGH-SCHOOL PRINCIPALS		SIMPLE RANKING BY 30 SENIOR HIGH-SCHOOL PRINCIPALS	WEIGHTED RANKING BY 37 HIGH-SCHOOL TEACHERS AT OGDEN, UTAH		WEIGHTED RANKING BY 62 CITY SUPERINTENDENTS AND TEACHERS' COLLEGE PRESIDENTS†	
	Average Number of Points Assigned to Each	Rank		Average Number of Points Assigned to Each	Rank	Average Number of Points Assigned to Each	Rank
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Health	17.7	1	1	21.2	1	18.4	2
Command of fundamental processes	15.2	3	4	14.5	3	30.8	1
Worthy home-membership	11.5	7	5	10.4	7	12.3	4
Vocation	11.9	6	6	11.7	5	10.4	5.5
Citizenship	16.4	2	2	13.4	4	17.6	3
Worthy use of leisure	13.0	5	7	11.4	6	10.4	5.5
Ethical character	14.3	4	3	17.4	2	.....	.....
Total	100.0	.....	.....	100.0	.....	99.9	.....

*Three of the groups weighted them on a scale of 100 points.

†*Second Yearbook*: "The Elementary School Curriculum." Washington, D. C., Department of Superintendence, 1924. p. 85.

[1]Data covering the experience and educational attainments of the cooperating principals may be found in an article by the writer which appeared in this Bulletin, January 19, 1927.

teachers' college presidents assigned 21.2 and 18.4 points, respectively, to the same objective." Thirty principals simply ranked it first. It will be seen that three groups ranked health first and one group ranked it second. The closest agreement among the four groups seems to be with respect to vocation.

The writer is fully aware of the shortcomings of such an investigation as this. First, the data present only the results of subjective judgment on the part of those participating. Second, such judgment on the part of individuals is apt to be unduly influenced by factors that are noticeably present at the time the answer is given; for example, one principal gave "health" a weight of 50, and added that he had just recovered from a serious illness. Third, the questionnaire method was used and it is generally agreed that this is inferior to direct interviews. While it is far from the purpose of the writer to claim overmuch with respect to the validity of such data as have been presented, yet he would offer the following in its defense:

First, while the data present only the results of subjective judgment of the participants, yet he is not aware of any scientific technique or statistical formula by which certain information, such as is here sought, can be determined objectively. Furthermore, it is the judgment of those persons who are in key positions, controlling educational policies, and the composite judgment of such persons deserves some consideration. Their experience and educational attainments have been related in a previous article, reference to which has already been made. Second, while extreme ratings were made by a few principals, as cited above, these tend to smooth out when aggregate weighting is considered. Third, when data are desired from the entire country, it is physically and financially impossible, in most cases at least, to visit so many schools distributed over such an extensive area in order to gather the data by personal interviews.

The data are submitted, then, for what they may be worth. The writer will content himself with venturing to suggest that they have some interesting implications, one of which is the difference in the rankings by the city superintendents and teachers' college presidents—who are more directly concerned with elementary education—and the rankings by the high-school teachers and principals.

ON THE REPORT OF THE OHIO RESEARCH DEPARTMENT

I THINK the research group of the Ohio State Teachers Association is justified in congratulating itself. Under the leadership of Prof. R. L. Morton back in the dim past—say 1920 or thereabouts—an excellent plan was established whereby annual reports were made. Subsequent presidents of the department could do no less than Morton did. But perhaps the bouquet should be handed rather to the secretaries than to the presidents. Very well, let's introduce Frank Prout. He got out the reports for a number of years and no doubt the particular form they took, and continued to take, was due to him.

A new report has just appeared covering the year from April, 1926, to April, 1927. As usual, each member of the department, if the secretary could induce him to respond to her circular letter, is listed, and under his name are shown the studies upon which he is engaged and those which he has completed within the year. His publications are likewise listed.

Really, these topics give an excellent impression of the work in educational

research in Ohio. Unfortunately, a number of workers who are undoubtedly accomplishing considerable fail to take the trouble to report to the secretary. Among those whose activities are always worth knowing about, but whose reports are missing, we note Dr. A. O. Heck, Dr. C. C. McCracken, Dr. W. G. Reeder, and Joseph A. Baer—all of these from our own faculty. We miss, too, reports from such men as Connor, Light, Peters, Powers, Pore, and Wallin.

I suppose that no two persons who might try to pick out the most interesting topics in the report would agree even remotely. To me, however, some were of special interest. Mrs. Brainerd, the secretary of the department this year, has been looking into the "School Success of Accelerated Pupils." Perhaps this has some bearing upon another topic with which she has been concerned, namely, the "Reduction of Failures."

Naturally, because of my recent attention to arithmetic, I find two of Superintendent Clark's topics especially interesting, "The Best Method of Teaching Subtraction" and "The Result of Postponing Addition and Subtraction of Fractions from the Fifth to the Sixth Grade." I wish I had space to discuss that last topic. To my mind, our arithmetic program is too ambitious. Long division is too hard for the fourth grade and if it is put forward into the fifth grade where its difficulty is more suited to the abilities of the children, then the formal and complete study of fractions ought, in turn, to go forward into the sixth grade. At least, that is the way it looks from the road. We shall be interested to hear from Clark as to his findings.

Doctor Gard, of Ohio University, indicates that he has finished a study on "High-School Marks as a Basis for College Entrance." I have always thought that if we could get a reasonably consistent method of marking in the high school, these marks would be vastly superior, as a basis of prophesying college success, to any tests which might be given at the end of the high-school course or at the beginning of the college course.

Professor Heckert, of Miami University, reported some topics which also appealed to me. He has completed a study on "The Use of the Question in Teaching" and one on "Observation, Reading, and Thinking in Acquiring Knowledge." He is engaged in studying "The Effect of Training upon Children's Ability to Interpret Arithmetical Problems," and, with his colleague, Professor Guiler, he is looking into "Arithmetical Aims as Determined by Required Readings in Content Subjects."

Superintendent Hixson is publishing in the *Ohio Farmer* a timely article for those who are interested in the administration of rural education. The title is "Why not Increase the Size of the Administrative Unit and Decrease the Cost of School Administration Two and One-Half Million Dollars Annually in Rural Ohio?"

If Assistant Superintendent Long works out his "Application of the New-Type Examination," we shall want to see the result. He indicates the completion of his work on a topic of considerable significance, namely, "The Use of Standard Tests to Measure and Increase the Efficiency of the Learning and Teaching Processes." If Mr. Long has anything in connection with this topic relating to increased learning, we hope he will put it into print.

Professor Mead, of Ohio Wesleyan University, has an array of six topics and nine published articles. I was particularly interested in his topic "The Qualities of Merit in 'Good' and 'Poor' Teachers." It seems to me that an examination of the difference in personality and talents between teachers known to be good or poor ought to yield something of value in selecting, assigning, and

eliminating teachers. Professor Mead has completed a study of the county normal schools of Ohio. I wonder what he has to say on that rather dubious subject. Of gossipy interest, at least, is the topic "Judgments of Administrators as to the Desirability of the College of Education *vs.* the Department of Education in a Liberal Arts College."

Dr. R. L. Morton reports that he is working on "A Manual of Laboratory Exercises in Educational Statistics." We need such a manual and I hope Morton will put this matter through, as no doubt he will. The publication is noted of his book, "Teaching Arithmetic in the Intermediate Grades." I haven't read it except in spots when it was in manuscript. From what I gathered in this manner, I don't hesitate to recommend the book. That's the way the Ohio Reading Circle Board thought about it too.

A. F. Myers is picking up a lot of ideas at Teachers College this year. He reports the completion of a study on the "Need of Practice and Experimental Facilities for Training Critic Teachers and Subject-Matter and Theory Teachers for Teachers Colleges." (What perfectly awful wording of a subject that is!) Myers also reports that he is working on "A Teacher-Training Program for the State of Ohio." He has published "The Fifteen-Hour Load for Critic Teachers at Ohio University" and, with Miss Beechel, the "Successful Placement of Teachers."

Garry Cleveland Myers reports that he is working on "Factors Causing Confusion in Learning" and "Clinical Studies of Poor Readers with High I. Q. 's." I wonder what he makes out of that topic, "Things Which Adults Do That Annoy Adolescents"? I wouldn't do a thing to annoy some adolescents who room next door to my house, nor would they do anything to annoy me. Oh no!

I see I have got no further than the M's, which generally means about half-way through the alphabet. I haven't said anything about John R. Patterson, yet I find that I have marked three of his studies as especially worth while. I have similarly marked one of the publications of Dr. S. L. Pressey, as well as Superintendent Prout's "Study of Individual Instruction."

I was so much interested in one of Superintendent Shelton's topics that I called him up on the long distance telephone and asked him to write me a short account of it. It appears in another part of this issue. I refer to the "Organization of a Research Department in Connection with the Department of Psychology of Wittenberg College." The plan of cooperation between the public school and a higher educational institution in matters of research is an idea which has promise.

We should like to hear more about Superintendent Skinner's "Vocabulary Study for the Fourth, Fifth, and Sixth Grades"; and also how C. W. Sutton, of the South High School, Cleveland, got along with his "Parallel Sections in Algebra and Geometry: X and Y Groups."

Although Professor Toops comes pretty well down in the alphabet, his name, like that of Abou ben Adhem, "leads all the rest" in the number of projects completed or under way, and in the number of published articles. The latter appear in every sort of setting—in psychological journals, in the *Proceedings* of the National Education Association, in periodicals devoted to vocational and industrial education, in the *Proceedings* of the Pennsylvania Schoolmen's Week, and in the *Transactions* of the Ohio College Association.

The State Department of Public Instruction is well represented in this report in the persons of C. B. Ulery and T. Howard Winters. Ulery has completed a study on "The Steps Required in Issuing Bonds and Completing a School Building Program in Ohio," (in

collaboration) and another study on the value of extension work of Ohio institutions. Winters has completed one study of high-school elimination and another on "New Texts and Easy Reading in Second-Year Latin." He also has an investigation under way concerning the careers of county normal graduates five years after their graduation.

I should like to conclude, as I began, by disclaiming the intention of evaluating the studies in this report. I have merely indicated those which appeared interesting to me. Moreover, I realize that the titles may be misleading. On the one hand, an attractive title may be quite at variance with the worth of the material itself. On the other hand, the character of the material may greatly surpass the effectiveness of the title. You never can tell about a title. I picked up a book the other day entitled *Bilingualism, with Reference to Bengal*. I don't know how I came to notice it. Certainly nothing in the title recommended it. Yet, upon examination, I found it to be a remarkable book—so remarkable that no less a person than Sir Michael Sadler has this to say about it: "This is a book of creative power. It will touch the imagination, and colour the judgment, of all who read it. It is scientific, compassionate, practical. It brings a message to India and to Britain. And not to India and Britain only, but to men and women in all countries, East and West." And so I say titles are treacherous. The writing itself is the thing; and the writings of these members of our educational research department do not, of course, appear in the department's report. B. R. B.

ON THE FIRING LINE

Freshman Week will be inaugurated by the Ohio State University in the Autumn Quarter. The Freshmen will report on Wednesday, September 21, and the program will continue through the following Monday, September 26. The University hopes in this way to orient the Freshman and bridge the gap between his high-school and college experiences. Special projects include laboratory work in methods of study; note-taking; use of the library; plans for a vocation; and lectures on college traditions, health, extra-curricular activities, college duties, and responsibilities.

R. G. Will, assistant in the Department of School Administration, of Ohio State University, will teach at Kent State Normal School during the summer session.

Dr. E. E. Lewis, of the Department of School Administration, is determined that the National Education Association shall hold its summer meeting in Columbus in 1928. Every teacher should help in bringing this convention to Columbus.

Superintendent G. E. Roudebush, of Grandview Heights, was recently appointed Assistant Superintendent of the Columbus schools and began his work April 1. His efficient management of the finances of the Board of Education, in addition to his progressive school system, are some of the reasons for his advancement. Superintendent W. C. Rohleder, of Hillsboro, was chosen the superintendent at Grandview Heights after a spirited campaign for the position.

The Board of Education, of Bridgeport, is planning a reorganization of its schools and within the near future a building program. The Board, after careful consideration, has chosen Superintendent Howard Ely, of Pataskala, to do this work. Mr. Ely is well trained and has had sufficient experience to give the board of education high-class service. We anticipate fine results for Bridgeport.

The Teachers' Retirement Fund has again been of service to the teachers of Ohio. W. E. Kershner who manages the affairs of the Retirement Board saw an opportunity for service when the legislature recently appropriated money for teachers' salaries long past due. This money will not be available for some time. Mr. Kershner immediately offered to lend boards of education sufficient money to pay the teachers at once, taking notes from the boards in anticipation of collecting this money from the state. He has guarded the lending of the money to the extent that boards of education are required to pay this money into the Teachers' Retirement Fund as soon as the boards receive it. The investment is good, and the teachers who received their pay are appreciating Mr. Kershner's efforts.

Superintendent F. P. Geiger, of New Philadelphia, recently dedicated a new junior high school which is the result of a year of progressive work by Mr. Geiger. New Philadelphia is coming rapidly to the front in offering a fine, progressive school program to the young people of the city.

Superintendent F. M. Shelton, of Springfield, gives the following account of a project carried on in Springfield with the cooperation of Wittenberg College:

During the year 1925-26 the Springfield Public Schools and the Psychology Department of Wittenberg College jointly conducted a Child Study Department under the direction of Miss Frieda A. Kiefer. About two hundred children were tested, most of whom were badly retarded. Twenty-five of the number were doing brilliant work.

The data secured from the tests were valuable in solving the educational adjustments for the children. As a direct result of the examinations given, an additional opportunity class has been organized. Springfield now has four opportunity classes located at three centers. Some of the more brilliant pupils examined were given the privilege of advancing another half-grade.

Some of the tests used were the Detroit First-Grade Intelligence Test; the Stanford Achievement Test, both primary and advanced; the Otis Group Intelligence Scale; the Porteus Maze Test; the Pinter-Patterson Short Performance Scale; the Pressey Primary Classification Test; and both the Stanford and Herring Revisions of the Binet-Simon Test. These tests were given by Miss Kiefer or by the more advanced psychology students under her direction.

The Clinic was suspended this year due to the fact that Miss Kiefer is away on a year's leave of absence for further graduate work. When she returns in September the work will be resumed on a larger scale. In the future the Department will be partially supported from the Community Chest Fund.

Mr. J. G. Hickox, head of the Department of Attendance and Research of the Warren City Schools, sends a course of study for the high school and writes as follows:

An attempt has been made to outline courses of study leading toward various vocations: medicine, nursing, law, engineering, agriculture, social service, elementary teaching, music, bookkeeping, and stenography. A course in home economics is planned for girls who wish to prepare for home making. A vocational course for boys offers an opportunity for the boy who wishes to have a general training which will fit him to make rapid progress in an apprenticeship. Both home economics and vocational courses are planned in such a way that they meet the needs of pupils of limited ability. Pupils in the high schools are urged to decide on a life career, and then to select a course of study which will give them training for their chosen career.

Dr. C. C. McCracken, of Ohio State University, has been appointed to survey several colleges in the South. He began his work at Memphis, Tennessee, the first week in May.

EDUCATIONAL READINGS

CAMENISCH, SOPHIA C. *Representative Courses of Study in English*, *EJ*, 16:279–95, April, 1927.

This is a historical study resulting from the investigation of twenty courses of study for the mechanics of English. By means of four tables the author shows the progress which has been made since 1919 in developing such courses of study. The first two tables show the inadequacy of the earlier courses, mostly before 1921; Table III shows some progress; and Table IV displays topics that are present in progressive courses. The author comments particularly on some eight or ten courses which seem prophetic of further progress. Finally, she submits a fifth table giving details for Grades VII-B to IX-A "as a suggestive starting-point for checking up one's local course."

O'ROURKE, L. J. *Self-Aids in the Learning of English*, *EJ*, 16:260–71, April, 1927.

This article describes in some detail a research program designed to develop by means of a self-instruction technique a more effective method for the mastery of the fundamental principles of correct English. Samples of the self-aid exercises employed are given in the article. Survey tests given at the beginning of the program and achievement tests of equal difficulty given at the end of it show a marked improvement in ability after the administration of the self-aid technique. In conclusion, fourteen points are listed which purport to show the advantages of this method. The first two of these points, embodying the primary purpose of the experiment are that a pupil is enabled to aid himself and that it makes individual instruction possible during class drill.

HEGEL, NEWTON R. *The Administration and Collection of Nonresident Tuition*, *ASBJ*, 74:43–45, April, 1927.

This is an interesting discussion of the problems involved in dealing with nonresident pupils in Minneapolis, Minnesota. There is a tendency for children from rural and village school districts to gravitate toward the city schools because of their superior educational advantages. This means that unless unusual care is exercised, the city will have to bear many burdens that justly belong to other districts or to the state as a whole. Indeed, even with the exercise of every precaution, it seems that the city cannot escape all such burdens. The author's discussion of the principal ones of the twenty-three special cases of tuition pupils should be helpful to anyone interested in similar problems in any city.

GATES, ARTHUR I. *Studies of Phonetic Training in Beginning Reading*, *JEP*, 18:217–26, April, 1927.

Dr. Gates here gives us an abstract of his latest investigation with respect to the value of phonetic against non-phonetic training in teaching beginners to read. The detailed results so far obtained in this series of experiments are included in a book which is to appear later. Dr. Gates says: "In the light of the theory which considers all learning to be the establishment of definite reactions to specific situations and in the light of established facts concerning the transfer of training, the validity of phonetic and other supplementary devices may well be questioned." Continuing, he says, "In general efficiency in silent reading comprehension, the non-phonetic pupils demonstrate markedly superior attainments. . . . . If it were necessary to choose between the two forms of training studied, the non-phonetic training would be selected."

DE WEERDT, ESTHER HURLEY. *The Transfer Effect of Practice in Related Functions upon a Group Intelligence Test*, *S&S*, 25:438–40, April 9, 1927.

This is an abstract of the findings of a study made to determine what effect practice in taking a number of tests has on scores made when taking group intelligence tests. Summarizing, we find that the Illinois Examination I, Form I, was given to two groups of children, at intervals of approximately three weeks. During this interval, the practice group was given a series of seven tests, such as substitution, addition, reading, cancellation. When the Illinois Examination was taken the second time, it was found that the control group made an average gain of 25 percent, while the corresponding gain by the practice group was 36 percent. As a result of her study, the investigator points out several dangers that may follow the giving of group tests, one of which is that persons giving group tests should know what previous experience children have had with similar tests, as former practice tends to effect later scores.

TURNEY, AUSTIN H. *A Study of Achieving and Non-Achieving High-School Pupils*, *SR*, 35:289–98, April, 1927.

If intelligence tests indicate what a pupil ought to do, what factors explain the discrepancy that often appears between what he ought to do and what he does do, and what is the relative importance of these factors? To attempt to answer this question, this study was made.

NOTE.—The abbreviations used in this number are: *EJ*, English Journal; *ASBJ*, American School Board Journal; *JEP*, Journal of Educational Psychology; *S&S*, School and Society; *SR*, School Review; *PS*, Pedagogical Seminary; and *EAS*, Educational Administration and Supervision.

The subjects were selected from each of the four classes of the University of Minnesota High School. Fifteen factors, named by thirty-four experienced teachers were considered. The subjects were rated on such factors as health, self-confidence, industry, and leadership, by fifteen members of the high-school faculty, from two to seven instructors rating each pupil. The median ratings were then correlated with the pupils' achievement. These correlations ranged from .210 in the case of personal attractiveness to .710 in the case of accuracy. The total rating correlation between all fifteen factors and achievement was .767.

HUFF, R. L. *Percept Content of School Children's Minds*, PS, 34:129–43, March, 1927.

Informal tests were given to school children in a very poor, congested city district to find out what the children knew about common objects, parts of the body, the origin of various commodities, and the names of colors. Ninety percent of the children had only the concepts of the colors, parts of the body, and two or three common objects. Less than half the children knew the source of such commodities as sugar or silk. A rough relationship was found between percepts and both mental age and intelligence quotients; but intelligence tests were not used to explain the poor development of percepts in some of the children. It was shown that percepts could be developed only by contact with real objects, pictures, or with some other such representation. The chief part played by intelligence appeared to be that the bright children required considerably less exposure than the dull children. All children, however, regardless of intelligence, required some degree of exposure if percepts were to be formed.

SYMONDS, PERCIVAL M. *The Measurement of Teaching Efficiency in High School*, EAS, 13:217–31, April, 1927.

The author summarizes various ways which have been proposed for the measurement of teachers and teaching ability. It appears that even the more elaborate schemes are decidedly unreliable unless they are applied several times. The author quotes, evidently with approval, Crabbs' statement that the measuring of teaching efficiency has passed through three stages—first, that of general impression, second, that of method rating, third, that of objective measurement. Although a number of writers have advocated the use of standardized tests as measures of teaching efficiency, Professor Symonds discredits this method. "Possibly," he says, "with greater refinement of tests they may be used for this purpose but not today." He believes that the rating scale when carefully planned with all possible checks to obtain objectivity and avoid the halo "is the best method of measuring teaching efficiency today."

SALM, CONNOR K. *A Score Card for Judging the Recitation*, SR, 35:281–85, April, 1927.

This article presents a proposed score card for judging the recitation. The writer states that it "has been prepared for the purpose of supervising teaching, not teachers," and for only one kind of recitation, the question-and-answer type. Three major divisions, "Economy of time," "Conduct of recitation," and "Assignment" are included, each being divided into numerous subheads. The writer says, "No attempt is made to evaluate the individual questions or answers, as it is not the purpose of the score card to rate the teacher but rather to supervise the actual progress of the recitation." The reviewer is inclined to feel, however, that even this objective could be more accurately attained if the thirty-five items were given carefully assigned values, so that the scorer could have some index of their relative worth.

WOODROW, HERBERT, AND BEMMELS, VIOLET. *Overstatement as a Test of General Character in Pre-School Children*, JEP, 18:239–46, April, 1927.

Do children of pre-school age tend to overstate their answers to such questions as "Can you write your name?" "Can you tie a bow?", "Can you turn a somersault?", "Can you tell the story of Little Boy Blue?" If there is a tendency toward overstatement, is such a tendency an index of their general character? These questions define the problem attacked in this investigation. With two groups of pre-school children it was found that those children whose character was rated above average by their teachers, overstate less than do the others.

WITTY, PAUL A., AND LEHMAN, HARVEY C. *The Play Behavior of Fifty Gifted Children*, JEP, 18:259–65, April, 1927.

This study is similar to previous studies made by Terman and reported by him. The purpose of Witty and Lehman was to make "an intensive study of a relatively small group," rather than to make a more comprehensive study. Fifty children in Grades III to VIII, who had an I. Q. of 140 or above (Stanford Revision, Binet-Simon) were paired with a like number of children whose I. Q. ratings ranged from 90 to 110. Both groups showed "the same versatility of interest in play and engaged in the same number of activities." The gifted children were "more solitary" in their play, engaging more frequently in, and spending more time upon reading. "Motor-type activities" were participated in more often by the boys of average intelligence, but the writers point out that these findings do not justify the generalization that gifted boys find less interest in most activities which are motor in nature. The gifted boys engaged more often than did the others in tennis, baseball with an indoor or playground ball, and gymnasium work.

IN PAPER COVERS

NEBRASKA STATE TEACHERS ASSOCIATION. *The Inequality of Educational Opportunity in Nebraska.* Lincoln, Nebraska, Nebraska State Teachers Association, 1926. 33 pp.

The Research Committee of the Nebraska State Teachers Association selected twenty-two counties, comprising three cross-sections of the state, for this study. The purpose of the investigation was to measure and compare the financial ability of the districts in these counties to provide respectable school facilities as judged by modern standards. It is pointed out that the state includes 7,083 separate school districts, and that 95 percent of the school revenue is raised locally. It was found that there is "gross inequality" in wealth, levies, and expenditures. One district has less than three thousand dollars of wealth per pupil in average daily attendance, while another has nearly two hundred and forty thousand dollars. Some districts spend twenty-five dollars per pupil, while others spend more than six hundred dollars; levies range from less than one mill to twenty-one. Many schools do not have such simple equipment as jacketed stoves, globes, small libraries, or pictures. The unusual graphs and drawings picture especially well the conditions found.

CAMP, HAROLD L. *Superintendents' Handbook for North Dakota.* Grand Forks, North Dakota, University of North Dakota, 1926. 40 pp. (School of Education Bulletin No. 4, Vol. X, No. 5)

If the superintendent will use this handbook as a guide, and then season it with an abundance of common sense, tact, and good judgment, it will prove very valuable to him. If, however, he assumes to himself the rights, duties, and prerogatives given, and tries to carry them out impersonally and uncritically, he will let himself in for a vast deal of trouble. The good superintendent manages his school, his board of education, his teachers, his pupils, his patrons; he doesn't run them, in spite of the author's statement that, "The superintendent should remember that he receives his salary for running the school, and not for managing community enterprises."

Under "cooperation" the following is said: "The superintendent will frequently find that he wishes to make some use of cooperative associations, such as the Parent-Teacher Association, and the Commercial Club." The emphasis is all wrong. He should not even attempt to "make use of," but should "cooperate with." It is even more obligatory on the superintendent to cooperate in the right way with community organizations, especially the Parent-Teacher Associations, than it is for them to subject themselves to his domination.

ENGELHARDT, N. L., REEVES, C. E., AND WOMRATH, G. F. *Standards for Public School Janitorial-Engineering Service.* New York, Bureau of Publications, Teachers College, Columbia University, 1926. 53 pp.

This is a welcome addition to measurement in school administration. In many good buildings there is inadequate or inefficient janitorial service. A score card with definite standards brings to light all conditions whether favorable or unfavorable. The score card is built on the same general plan as the Strayer-Engelhardt score card for buildings and should prove a useful aid in the more adequate measurement of building conditions.

OHIO STATE TEACHERS ASSOCIATION. *Teacher Training As a State Function.* Columbus, Ohio, Ohio State Teachers Association, 1927. 47 pp.

This is a report of a study made by the Teacher-Training Committee of the Educational Council of the facilities now provided for the training of teachers in the state of Ohio. When the minimum standard of two years of professional training is applied to the Ohio situation, it is found that the state needs approximately thirty-five hundred trained teachers annually. With this basic information, the Committee proceeded to examine the capacity of the existing agencies for supplying this training. The report gives particular attention to the five state teachers colleges and the thirty county normal schools. Numerous tables and maps showing the sources of students for these two types of schools are given. Some parts of the state furnish but very few students. The Committee "offers no opinions or recommendations relative to the future development of Ohio's teacher-training program." It does, however, emphatically state that the five existing state teachers colleges are inadequate to meet the demand for well-qualified teachers for the state.

ENGELHARDT, FRED. *Survey Report New Prague Public Schools, New Prague, Minnesota.* Minneapolis, Minnesota, University of Minnesota, 1927. ix+97 pp. (University of Minnesota, College of Education, Educational Monograph No. 11, Bulletin, Vol. 30, No. 2)

A casual glance seems to indicate the conventional survey report. The first half of the report is given to a study of finances, child-accounting, and similar matters. The last half of the report comes as a pleasant surprise, since it presents a very careful measurement of achievement. An extensive series of tests was used, and the results are presented in both tables and graphs. The University of Minnesota is rendering a very fine type of service to the smaller school systems of the state through the series of surveys that are being carried on.

PSYCHOLOGICAL ABSTRACTS

The American Psychological Association began publishing its new journal, *Psychological Abstracts*, with the January, 1927, number. This periodical is edited by Professor Walter S. Hunter, of Clark University, who is assisted by eight cooperating editors, representing universities in seven European countries.

The journal, as one would suspect from its editorial staff, is international in character. It consists of noncritical abstracts of articles and books on psychological and cognate subjects, written by competent psychologists in America and Europe and published in English. The material is classified under seventeen main categories, such as Attention, Plant and Animal Behavior, Evolution and Heredity, and Social Functions of the Individual. It is intended that the abstracts shall be valuable, not only to psychologists, but also to persons who are working in allied fields, such as physiology, psychiatry, education, and biology. The managing editor is Herbert S. Langfeld, Princeton University, Princeton, New Jersey.

A COMPARISON OF DEPARTMENTAL AND GRADE TEACHING: A STUDY OF PROGRESS IN SUBJECT-MATTER

(*Continued from page 207*)

paired and the experiment was continued. The two teacher groups were maintained as before, both groups now teaching departmentally. The two pupil groups were maintained separately. As before, teachers were exchanged in the middle of the semester and the entire procedure was the same as in the original experiment, except that both groups were taught departmentally. The final tests of the previous experiment served to determine initial standing and final tests were given at the end of the semester. Scores were transmuted into T-score form and gains were computed and averaged.

The results for the total in this last semester showed that the departmental group made 41 percent greater gains than the grade group. If we take this as an indication that the departmental group actually has the advantage over the grade group, rather than being equal in ability, the results serve to magnify the importance of the advantage gained by the grade pupils in the original experiment. For, we may reason that the grade group made the better gains during the first semester even with this handicap. Stated differently, the results of the third semester indicate that the pupils of the original departmental group could surpass the pupils of the other group when conditions were similar. Their inferior showing in the original experiment would therefore be attributed to departmental teaching.

Still another study was made of the data arising from this experiment. It will be recalled that tests were administered at the end of the first semester. In other words, the entire experiment covered three semesters and tests were given at the the end of each semester. Gains were computed for each semester for all the pupils who had taken all these tests. After these gains had been computed and averaged they were represented graphically and studied to determine whether there was evidence of a period of confusion following the introduction of departmental teaching that would in part account for the apparent inferiority of departmental teaching.

In general, this last study gave strong evidence of such an adjustment period. During the first semester, the departmental group made relatively poor progress. During the second semester, they showed much improvement and made approximately as good gains as the grade group, and finally made considerably greater gains in the third semester than the group which had been originally taught by the grade method.